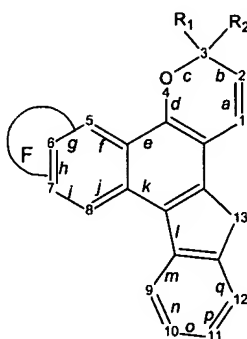


## IN THE CLAIMS

Please amend the claims as follows:

1. (PREVIOUSLY PRESENTED) A photochromic naphthopyran having a central nucleus of the formula:



wherein F is a dihydrofuran group fused to the *g*, *h*, or *i* side;

R<sub>1</sub> and R<sub>2</sub> are the atoms or groups providing photochromic properties to the naphthopyran.

2. (ORIGINAL) The photochromic naphthopyran of claim 1 wherein R<sub>1</sub> and R<sub>2</sub> are selected from the group consisting of aliphatic groups, aromatic groups, and heterocyclic groups.
3. (ORIGINAL) The photochromic naphthopyran of claim 1 wherein R<sub>1</sub> and R<sub>2</sub> are selected from the group consisting of alkyl groups, aromatic groups, and heterocyclic groups.
4. (ORIGINAL) The photochromic naphthopyran of claim 1 wherein R<sub>1</sub> and R<sub>2</sub> are selected from alkyl groups, phenyl groups, and naphthyl groups.
5. (CANCELLED)

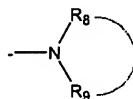
6. (CANCELLED)

7. (CANCELLED)

8. (CANCELLED)

9. (ORIGINAL) The photochromic naphthopyran of claim 1 wherein the 13-position has substituents  $R_3$  and  $R_4$ , wherein  $R_3$  and  $R_4$  individually represent

- a hydrogen atom,
- a hydroxy group,
- a halogen atom,
- a linear, branched, or cyclic C1-C6 alkyl, alkenyl, or alkynyl group,
- a linear, branched, or cyclic C1-C6 alkoxy or alkenoxy group,



an amino group:

in which  $R_8$  and  $R_9$ , which are the same or different, independently representing a hydrogen, a linear, branched, or cyclic alkyl group comprising 1 to 6 carbon atoms, an aryl or heteroaryl group, or representing (together with the nitrogen atom to which they are bound) a 5- to 7-membered ring which can comprise at least one other heteroatom selected from oxygen, sulfur and nitrogen, said nitrogen being optionally substituted with an  $R_{10}$  group, which is a linear or branched alkyl group comprising 1 to 6 carbon atoms, a phenyl, a benzyl, or a naphthyl,

an aryl or heteroaryl group selected from the group consisting of phenyl, naphthyl, phenanthryl, pyrenyl, quinolyl, isoquinolyl, benzofuranyl, thienyl, benzothienyl, dibenzofuranyl, dibenzothienyl, carbazolyl, indolyl,

a mono-substituted phenyl having a substituent at the para position that is a linking group,  $-(CH_2)_t-$  or  $-O-(CH_2)_t-$ , wherein  $t$  is the integer 1, 2, 3, 4, 5 or 6, connected to an aryl group, which is a member of another photochromic naphthopyran,

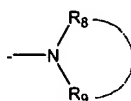
an aralkyl or heteroaralkyl group, the alkyl part of which is linear or branched, comprising 1 to 4 carbon atoms,

a  $-C(O)R_{11}$ ,  $-OC(O)R_{11}$ , or  $COOR_{11}$  group, wherein  $R_{11}$  is hydrogen, hydroxy, linear or branched C1-C6 alkyl, linear or branched C1-C6 alkoxy, phenyl, mono-substituted phenyl, naphthyl, mono-substituted naphthyl, amino, mono(C1-C6) alkylamino or di(C1-C6)alkylamino, e.g., N,N-dimethyl amino, N-methyl-N-propyl amino, morpholino, piperidino or pyrrolidyl, said amino substituents being selected from the group consisting of C1-C6 alkyl, phenyl, benzyl and naphthyl, and said benzyl and phenyl substituents being C1-C6 alkyl or C1-C6 alkoxy,

a group  $-OR_{12}$ , wherein  $R_{12}$  is a C1-C6 acyl, an aralkyl or heteroaralkyl group with a C1-C3 alkyl portion, a (C3-C7)cycloalkyl group, a (C2-C4)alkyl group, or  $R_{12}$  is the group,  $-CH(R_{13})R_{14}$ , wherein  $R_{13}$  is hydrogen or C1-C3 alkyl and  $R_{14}$  is  $-CN$ ,  $-CF_3$ , or  $-COOR_{15}$ , wherein  $R_{15}$  is hydrogen or linear, branched, or cyclic alkyl, aralkyl or heteroaralkyl,

a group  $-CH(R_{16})_2$  wherein  $R_{16}$  is  $-CN$  or  $-COOR_{15}$ ,

a group  $-CH(R_{15})R_{17}$ , wherein  $R_{17}$  is  $-COOR_{11}$ ,  $-C(O)R_{18}$  or  $-CH_2OR_{19}$ , wherein  $R_{18}$  is hydrogen, linear, branched, or cyclo-alkyl, aryl groups, amino group of formula



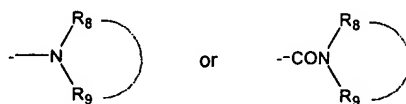
$R_{19}$  is hydrogen,  $-C(O)R_{11}$ , alkyl, alkoxyalkyl, phenylalkyl, mono-alkoxy substituted phenyl-alkyl, or aryl groups,

a polyether, polyamide, polycarbonate, polycarbamate, polyurea, polyester residue, or a group ended by a polymerizable residue;

or  $R_3$  and  $R_4$  may together form a 3- to 7-member spiro-cyclic ring which can comprise at least one heteroatom selected from oxygen, sulfur, and nitrogen.

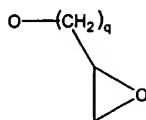
10. (PREVIOUSLY PRESENTED) The photochromic naphthopyran of claim 9 wherein,

- (a) in the 5- and/or 8-position, a group  $R_6$  is present wherein  $R_6$  represents
- a hydrogen,
  - a halogen, a linear or branched alkyl group which comprises 1 to 12 carbon,
  - a cycloalkyl group comprising 3 to 12 carbon atoms, a linear or branched alkoxy group comprising 1 to 12 carbon atoms,
  - a haloalkyl, halocycloalkyl, or haloalkoxy group corresponding to the alkyl, cycloalkyl, alkoxy groups above respectively, which are substituted with at least one halogen atom,
  - a linear or branched alkenyl or alkynyl group comprising 1-12 carbon atoms,
  - a linear or branched alkenoxy or alkynoxy group comprising 1-12 carbon atoms,
  - an aryl or heteroaryl group having the same definition as that given above for aryl or heteroaryl groups within the definitions of  $R_3$ ,  $R_4$ ,
  - an aralkyl or heteroaralkyl group, the alkyl group, which is linear or branched, comprising 1 to 4 carbon atoms, and the aryl and heteroaryl groups having the same definitions as those given above for  $R_3$ ,  $R_4$ ,
  - an amine or amide group:  $--NH_2$ ,  $--NHR_8$ ,  $--CONH_2$ ,  $--CONHR_8$ ,



$R_8$ , and  $R_9$  having their respective definitions given for the amine substituents of the values  $R_3$ ,  $R_4$ ,

a  $--C(R_{15})_2R_{11}$ ,  $--OCOR_{15}$ , or  $--COOR_{15}$  group, wherein  $R_{11}$  and  $R_{15}$  are defined supra in  $R_3$  and  $R_4$ , a methacryloyl group or an acryloyl group,

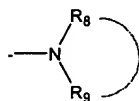


an epoxy group having the formula,

in which  $q = 1, 2$  or  $3$ ,

a polyether, polyamide, polycarbonate, polycarbamate, polyurea or polyester residue, or a group with polymerizable residue,

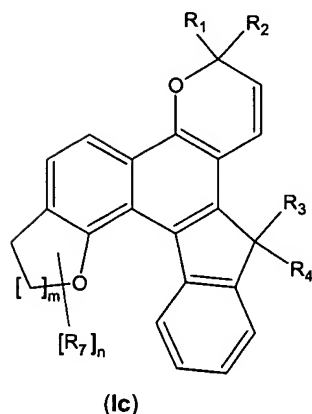
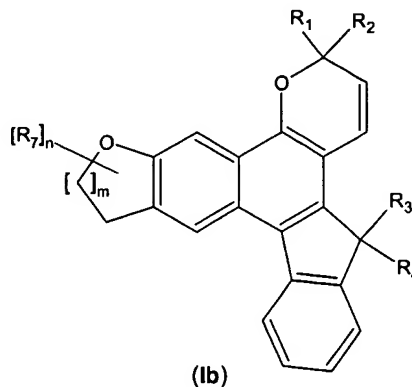
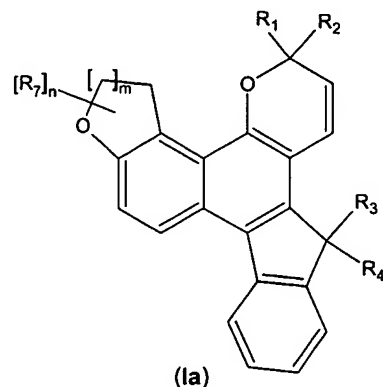
- (b) in the 9-, 10-, 11-, and 12-positions there are at most 4  $R_5$  groups, each being the same as  $R_6$ , defined hereinbefore; or
- (c) two adjacent  $R_5$  together form a 5- to 7-member aromatic or non-aromatic ring which can comprise at least one heteroatom selected from oxygen, sulfur, and nitrogen, and/or at least one substituent selected from the group consisting of a C1 to C6 alkyl group which is linear, branched, or cyclic, a C1 to C6 alkoxy group which is linear or branched, and an amine group of formula  $-NH_2$ ,  $NHR_8$ , or



as defined in  $R_3$  and  $R_4$  for amine groups, said aromatic or non-aromatic ring can be optionally annelated with a benzene group.

11. (ORIGINAL) The photochromic naphthopyran of claim 10 wherein  $R_1$  and/or  $R_2$  represent a para-substituted phenyl group, said substituents on the para-substituted phenyl group selected from hydrogen, alkyl, alkoxy, dialkylamino, diarylamino, or  $R_1$  and  $R_2$  together form an adamantyl group or norbornyl group or anthracenylidene group;

12. (CURRENTLY AMENDED) The photochromic naphthopyran of claim 1 wherein the naphthopyran has a formula selected from the group consisting of (Ia), (Ib), and (Ic)



above ~~below~~, in which:

m is ~~an~~ the integer 1 or 2,

R<sub>1</sub> and/or R<sub>2</sub>, independently represent optionally substituted aryl or heteroaryl groups the basic structure of which is selected from phenyl, naphthyl, biphenyl, pyridyl, furyl, benzofuryl, dibenzofuryl, N--(C<sub>1</sub>-C<sub>6</sub>)alkylcarbazole, thienyl, benzothienyl, dibenzothienyl, julolidinyl groups; R<sub>1</sub> and/or R<sub>2</sub> advantageously representing a para-substituted phenyl group, said substituents are selected from hydrogen, alkyl, alkoxy, dialkylamino, diarylamino, or R<sub>1</sub> and R<sub>2</sub> together form an adamantyl group or norbornyl group or anthracenylidene group;

R<sub>3</sub> and R<sub>4</sub> are the same or different, and may represent independently  
a hydrogen, a hydroxy, a halogen,

a linear, branched, or cyclic alkyl group that comprises 1 to 6 carbon atoms,

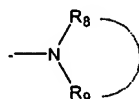
a  $-OR_{20}$  group, wherein  $R_{20}$  is (C1-C3)alkyl, phenyl(C1-C3)alkyl, mono(C1-C3)alkylphenyl(C1-C3)alkyl, mono(C1-C3)alkoxyphenyl(C1-C3)alkyl, (C1-C3)alkoxy(C2-C4)alkyl, fluoro(C1-C3)alkyl, or chloro(C1-C3)alkyl,

an optionally substituted phenyl or benzyl group, said substituents being mono, di-, or tri-substituents, and selected from group  $R_{20}$ ,

a  $-C(R_{21})_2X$  group, wherein X is hydroxy, alkoxy, benzyloxy, C1-C6 acyloxy, an ester group:  $-COOR_{11}$ , an amine or amide group:  $-NH_2$ ,  $-NHR_8$ ,  $-N(R_8)_2$ ,  $-CONH_2$ ,  $-CONHR_8$ ,  $-CON(R_8)_2$ ,  $R_{21}$  is hydrogen, C1-C6 alkyl, phenyl or naphthyl with C1-C6 alkyl or C1-C6 alkoxy substituents,

a polyether or polyurea residue,

or  $R_3$  and  $R_4$  together form a 5- to 7-member optionally substituted spiro-cyclic ring which can comprise at least one heteroatom selected from oxygen, sulfur, and nitrogen, and/or at least one substituent selected from the group consisting of a C1 to C6 alkyl group which is linear or branched, a C1 to C6 alkoxy group which is linear or branched, and an amine group of formula  $-NH_2$ ,



$NHR_8$ ,

the spiro-ring may be annelated with one or two benzene groups;

$R_7$ , which are identical or different, represent, independently

a hydrogen,

a linear or branched alkyl group which comprises 1 to 6 carbon atoms,

a cycloalkyl group comprising 3 to 7 carbon atoms,

a linear or branched alkoxy group comprising 1 to 6 carbon atoms,

a haloalkyl, halocycloalkyl, or haloalkoxy group corresponding to the alkyl, cycloalkyl, alkoxy groups above respectively, which are substituted with at least one halogen atom,

a linear or branched alkenyl or alkynyl group comprising 1-12 carbon atoms,

a linear or branched alkenoxy or alkynoxy group comprising 1-12 carbon atoms,  
n is an integer from 0 to 2.

13. (ORIGINAL) A photochromic article comprising a polymeric layer containing a photochromic amount of a photochromic naphthopyran according to claim 1.
14. (ORIGINAL) A photochromic article comprising a polymeric layer containing a photochromic amount of a photochromic naphthopyran according to claim 2.
15. (ORIGINAL) A photochromic article comprising a polymeric layer containing a photochromic amount of a photochromic naphthopyran according to claim 3.
16. (ORIGINAL) A photochromic article comprising a polymeric layer containing a photochromic amount of a photochromic naphthopyran according to claim 4.
17. (ORIGINAL) A photochromic article comprising a polymeric layer containing a photochromic amount of a photochromic naphthopyran according to claim 9.
18. (ORIGINAL) A photochromic article comprising a polymeric layer containing a photochromic amount of a photochromic naphthopyran according to claim 10.
19. (ORIGINAL) A photochromic article comprising a polymeric layer containing a photochromic amount of a photochromic naphthopyran according to claim 11.
20. (ORIGINAL) A photochromic article comprising a polymeric layer containing a photochromic amount of a photochromic naphthopyran according to claim 12.